

# **Estimated Benefits of a Fully Implemented U.S. Geological Survey National Streamflow Information Program in Massachusetts**

## **... from the National Streamflow Information Program**

This Fact Sheet is one in a series that highlights information or recent research findings from the USGS National Streamflow Information Program (NSIP). The investigations and scientific results reported in this series require a nationally consistent streamgaging network with stable long-term monitoring sites and a rigorous program of data collection, quality assurance, management, archiving, and synthesis. NSIP produces multipurpose, unbiased surface-water information that is readily accessible to all.

One goal of the U.S. Geological Survey's National Streamflow Information Program (NSIP) is to provide a national 'backbone' streamgage network with about 4,780 federally funded streamgages selected to provide streamflow information to meet national needs. In Massachusetts, there will be 23 of these planned federally-funded streamgages. These national-need streamgages would be supplemented with partnership-funded streamgages to help fulfill the need for local, state, and regional streamflow-information. National streamflow-information needs are defined in NSIP as follows:

- Streamflow forecast locations of the National Weather Service (NWS) and the National Resource Conservation Service (NRCS);
- Interstate compacts, court decrees, international treaties, and major national and state-line crossings;
- Major river basin outflows to downstream basins, estuaries, oceans, and Great Lakes;
- Watersheds mostly unaffected by diversion and regulation to evaluate the responses to climate, land, and water use; and
- USGS major water-quality programs.

To fully implement NSIP in Massachusetts only would require \$0.54M in one-time costs and \$0.52M annually (in 2006 dollars). These one-time costs include reactivating 3 discontinued streamgages, installing 3 new streamgages, flood hardening streamgages used by the NWS for flood forecasts, and updating real-time telemetry on all streamgages in Massachusetts. The annual costs are for operation and maintenance of the 23 NSIP federal-goal streamgages, to cover the fixed costs of the entire network in Massachusetts, regional assessments of streamflow information, additional data collection and analysis during and following floods and droughts, improved streamflow-information delivery, and development of new equipment and techniques to measure streamflow more accurately, reliably, and at less cost.

### **Savings to Current Streamgaging Partners in Massachusetts**

The USGS currently (2007) operates 115 continuous-record streamgages in Massachusetts, of which 15 were selected to be part of the NSIP federal-goal streamgage network. Currently, 5 of these 15 streamgages are funded through the Cooperative Water Program (CWP) and 10 are fully funded by NSIP. If NSIP were fully funded in Massachusetts, all 15 of these streamgages would be completely federally funded (as would 8 additional streamgages in Massachusetts not currently operated by the USGS). In addition, for the 100 existing streamgages (and for any future/new streamgages) in Massachusetts that would remain funded through the CWP, the cost of operation would be about 40 percent less than the current costs because NSIP would cover the infrastructure costs of all streamgages

operated in the Nation. These infrastructure costs are costs of the streamgaging network that are for the most part independent of the number of streamgages operated and cover such items as salary for management and supervision of the Massachusetts network, maintenance and updates of the database, and administrative support of the program. These changes would translate into a savings to current funding partners in Massachusetts of about **\$49,335** per year for full federal funding of the 5 existing NSIP national needs streamgages not already NSIP funded and **\$394,700** per year savings due to the infrastructure costs being covered for the 100 streamgages that would remain cooperatively funded for a total savings to funding partners in Massachusetts of about **\$444,035 per year** (accounts for the USGS CWP contribution in existing funding – see Appendix for computations).

### **Additional Benefits to Massachusetts of a fully implemented NSIP**

In addition to the fiscal benefits discussed above, users of streamflow information in Massachusetts also will benefit from NSIP based on the other enhancements the program will provide. These enhancements will include the following:

1. A total of 23 streamgages would be operated and maintained in Massachusetts funded entirely by federal funds (total network in Massachusetts is now 115 streamgages; an equivalent of 10 are fully funded by NSIP). Many, if not all, of the existing (and future new) streamgages not funded by NSIP would remain funded through the Cooperative Water Program at a 50-50 cost share, but at a cost approximately 40 percent less than today.
2. Developments in data input and analyses techniques, as well as investments in other new software and hardware for the National Water Information System (NWIS) database will enhance data delivery to provide more accurate and timely streamflow information.
3. Enhanced data acquisition and analyses during and after floods and droughts will provide a better understanding of these hydrologic extremes for better predictions in the future.
4. Regional assessments of the streamflow information will provide better estimates of streamflow at locations distant from streamgages and also information as to where to place new streamgages to optimize the streamgaging network. This information will also be central to the NSIP goal of being able to predict streamflow characteristics at any point on any stream in the nation. These assessments will also provide insight to any trends in streamflow caused by changes in land use, water use, or climate.
5. Research and development will provide better equipment and techniques to measure and understand streamflow.

## **Appendix — Computations for Massachusetts Partner Savings from USGS NSIP**

### **1. Full Federal funding for existing NSIP streamgages not already funded by NSIP:**

5 streamgages X \$14,300 = \$71,500 per year; USGS partners currently (2007) pay about 69 percent to the USGS's 31 percent —  $\$71,500 \times 0.69 =$  **\$49,335/year partner savings**

### **2. Reduced cost per streamgage because infrastructure costs covered:**

\$14,300/streamgage X 0.40 = \$5,720 reduction in per streamgage costs;

Cooperative Water Program partners currently pay 69 percent, so their share of these savings =  $0.69 \times \$5,720 = \$3,947$ . Savings = 100 streamgages X \$3,947 = **\$394,700 per year**

**3. Total savings** = \$49,335 + \$394,700 = **\$444,035 per year**